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EXAMINER	
RYMAN, DANIEL J	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 02/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/813,491	LIBERTI ET AL.	
	Examiner	Art Unit	
	Daniel J. Ryman	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 54-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21 and 54-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 March 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figures 1, 3, and 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference character(s) mentioned in the description: ref. 1300 (see page 16, line 26 and Fig. 13). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: ref. 800 (see page 10, lines 32-34 and Fig. 8). Corrected drawing sheets, or amendment to the specification to add

the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to because on page 13, lines 18-23 the ATRF has ref. number 911 while in Fig. 11A the ATRF has ref. number 910; on page 13, lines 24-32 the ATRF has ref. number 912 while in Fig. 11B the ATRF has ref. number 911; on page 18, lines 2-23 the STAP filters have ref. number 1252 while in Fig. 15 the STAP filters have ref. number 1250; and on page 18, lines 2-23 and Fig. 15 ref. 1250 and ref. 1410 point to the same object in Fig. 15. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as

not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The abstract of the disclosure is objected to because it exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 3-9, and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moshavi, Shimon (Moshavi, Shimon, "Multi-User Detection for DC-CDMA Communications," IEEE Communications Magazine, October 1996, pp. 124-133.) in view of Dimos et al. (USPN 5,596,600).

8. Regarding claims 1 and 12, Moshavi discloses a method in a combination system for enabling the receiver to receive input signals at varied power levels in the presence of interference wherein said combination comprises a control processor and a plurality of SIC processors in a successive arrangement (pages 130-131, Successive Interference Cancellers), said method comprising: ordering user signals according to a pre-defined methodology and assigning each user signal to one of the SIC processors (pages 130-131, Successive Interference Cancellers) wherein each SIC processor comprises a conventional detector (pages 130-131,

Successive Interference Cancellers, lines 13-14), a respread processor (pages 130-131, Successive Interference Cancellers, lines 16-20); and a complex mathematical operation processor for canceling the reconstructed signal for the user from the total received signal (pages 130-131, Successive Interference Cancellers, lines 21-23); communicating a separate user code associated with the user signal to each SIC processor according to the ordering (pages 130-131, Successive Interference Cancellers, lines 16-20); in each successive SIC processor, performing the steps of: despreading, in the conventional detector, the received signal and estimating a symbol transmitted for the desired user signal (pages 130-131, Successive Interference Cancellers); communicating the symbol estimate to the respread processor (pages 130-131, Successive Interference Cancellers); spreading, in the respread processor, the symbol estimate (pages 130-131, Successive Interference Cancellers); estimating a channel for the user associated with the SIC processor and reconstructing the signal interference associated with the user signal (pages 130-131, Successive Interference Cancellers); and canceling, in a mathematical operations processor, the reconstructed signal for the user associated with the SIC processor from the total received signal if a plurality of SIC processors remain, inputting the output of the current SIC processor to the next successive SIC processor (pages 130-131, Successive Interference Cancellers).

Moshavi does not expressly disclose that the SIC processor is an SIC-ATRF processor where the SIC-ATRF processor combines SIC with adaptive temporal reconstruction filtering such that each SIC-ATRF processor contains an adaptive temporal filter (ATRF). Dimos teaches, in a CDMA communication system, having a processor that performs adaptive temporal reconstruction filtering in order to cancel narrowband interference in the system (col. 1, line 48-

col. 2, line 49) where, as broadly defined, the ATF performs adaptive temporal reconstruction filtering since the ATF reconstructs the signal without the interference. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the SIC processor be an SIC-ATRF processor where the SIC-ATRF processor combines SIC with adaptive temporal reconstruction filtering such that each SIC-ATRF processor contains an adaptive temporal filter (ATRF) in order to use the ATRF to cancel any narrowband interference in the received signal, where the received signal comprises spread user signals, in addition to the user interference cancelled by the SIC such that a cleaner signal is produced.

9. Regarding claim 3, Moshavi in view of Dimos does not expressly disclose that each conventional detector is an IS-95 rake conventional detector; however, Moshavi in view of Dimos does disclose that each detector is a conventional detector (Moshavi: pages 130-131, Successive Interference Cancellers, lines 13-14). Examiner takes official notice that IS-95 is a well-known CDMA standard and that rake receivers are well known in the art in order to receive multi-path signals. It would have been obvious to one of ordinary skill in the art at the time of the invention to have each conventional detector be an IS-95 rake conventional detector since IS-95 rake conventional detectors are well known in the art as a way to receive multi-path signals.

10. Regarding claim 4, Moshavi in view of Dimos discloses that each ATRF comprises: tap weights (Dimos: col. 2, lines 19-45); a tap delay line (Dimos: col. 1, lines 48-64 and col. 2, lines 19-45) where the tap delay line is used to match the tap weights with the delayed samples (col. 1, lines 51-56); and a mathematical summing circuit (Dimos: col. 1, lines 51-56 and col. 2, lines 24-26) where "combining a minimum number of input samples to estimate interference" teaches a summing circuit.

11. Regarding claim 5, Moshavi in view of Dimos discloses that each SIC-ATRF processor further comprises a minimum cost channel estimate (MCCE) weight update processor (Moshavi: pages 130-131, Successive Interference Cancellers and Dimos: col. 2, lines 31-45) since Dimos teaches using a minimum cost weight update processor (Dimos: col. 2, lines 31-45) where the weights are determined for samples received over a channel (Dimos: col. 2, lines 31-45).

12. Regarding claim 6, Moshavi in view of Dimos discloses that each ATRF further comprises a minimum cost channel estimate weight update processor (Dimos: col. 2, lines 31-45).

13. Regarding claim 7, Moshavi in view of Dimos discloses that each ATRF is a minimum mean square error filter (Dimos: col. 2, lines 31-45, esp. col. 2, lines 36-39).

14. Regarding claim 8, Moshavi in view of Dimos suggests that the output of each respread processor is the input for the ATRF. Moshavi teaches that the respread signal is canceled from the received signal to produce a cleaned version of the received signal (Moshavi: pages 130-131, Successive Interference Cancellers, lines 16-20). Dimos teaches that the ATRF is not effective against wideband interference, but is very effective against narrowband interference (Dimos: col. 1, line 48-col. 2, line 18). Dimos also teaches that the ATRF can distort the PN sequence of the output (col. 1, line 48-col. 2, line 18). Examiner notes that using the ATRF before the SIC components will cause the SIC components to receive a signal with a distorted PN sequence. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the output of each respread processor be the input for the ATRF in order to cancel narrowband interference from the signal in a manner which will not affect the SIC performance through PN sequence distortions.

15. Regarding claim 9, Moshavi in view of Dimos suggests that the input to each ATRF further comprises the outputs of the respread processors in all the previous SIC-ATRF processors (Dimos: Fig. 1 and col. 1, line 48-col. 2, line 45) where Dimos discloses that an ATRF is used to cancel narrowband interference from a received signal comprising multiple wideband user signals.

16. Regarding claim 13, Moshavi in view of Dimos discloses that the step of ordering user signals according to a pre-defined methodology comprises ranking signals in descending order of received powers (Moshavi: pages 130-131, Successive Interference Cancellers, lines 10-11).

17. Regarding claim 14, Moshavi in view of Dimos implicitly discloses that the step of ordering user signals according to a pre-defined methodology comprises identifying signals above a certain threshold (Moshavi: pages 130-131, Successive Interference Cancellers, lines 10-11) where by ranking signals according to received power there must be a threshold at which the system determines a received signal is a user signal rather than noise.

18. Regarding claim 15, Moshavi in view of Dimos discloses that the channel estimation step further comprises: determining the adaptive filter tap weights that minimize a pre-determined cost function between the received signal and an output of the adaptive filter and updating, in the ATRF, the filter tap weights (Moshavi: pages 130-131, Successive Interference Cancellers and Dimos: col. 2, lines 31-45) where Dimos teaches using a minimum cost weight update processor (Dimos: col. 2, lines 31-45) where the weights are determined for samples received over a channel (Dimos: col. 2, lines 31-45).

19. Regarding claim 16, Moshavi in view of Dimos discloses that the pre-determined cost function is a minimum mean square error function (Dimos: col. 2, lines 31-45, esp. col. 2, lines 36-39).

20. Regarding claim 17, Moshavi in view of Dimos discloses that the channel estimation step further comprises: determining the adaptive filter tap weights by jointly minimizing the cost function between the received signal and the sum of the outputs of the respread processors of previous SIC-ATRF processors and updating, in the ATRF, the filter tap weights (Moshavi: pages 130-131, Successive Interference Cancellers and Dimos: col. 2, lines 31-45) where Dimos teaches using a minimum cost weight update processor (Dimos: col. 2, lines 31-45) where the weights are determined for samples received over a channel (Dimos: col. 2, lines 31-45).

21. Regarding claim 18, Moshavi in view of Dimos discloses that the pre-determined cost function is a minimum mean square error function (Dimos: col. 2, lines 31-45, esp. col. 2, lines 36-39).

22. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshavi, Shimon (Moshavi, Shimon, "Multi-User Detection for DC-CDMA Communications," IEEE Communications Magazine, October 1996, pp. 124-133.) in view of Dimos et al. (USPN 5,596,600) as applied to claim 1 above, and further in view of Applicant's Admitted Prior Art.

23. Regarding claim 2, Moshavi in view of Dimos does not expressly disclose that each conventional detector is an IS-95 conventional detector comprising a short code despreader, a long code despreader, and a 64-ary matched filter bank; however, Moshavi in view of Dimos does disclose that a conventional detector is used (Moshavi: pages 130-131, Successive Interference Cancellers, lines 13-14) and that matched filter banks are used in detection

(Moshavi: pages page 125, The Conventional Detector). Applicant admits, as prior art, that a fundamental component of standard IS-95 receivers is a conventional IS-95 detector which comprises a short code despreader, a long code despreader, and a 64-ary matched filter bank (Fig. 3 and page 6, line 30-page 7, line 13). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have each conventional detector be an IS-95 conventional detector comprising a short code despreader, a long code despreader, and a 64-ary matched filter bank since the conventional detector is a fundamental component of standard IS-95 receivers.

24. Claims 10, 11, and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moshavi, Shimon (Moshavi, Shimon, "Multi-User Detection for DC-CDMA Communications," IEEE Communications Magazine, October 1996, pp. 124-133.) in view of Dimos et al. (USPN 5,596,600) as applied to claim 1 above, and further in view of Komatsu (USPN 5,818,882).

25. Regarding claim 10, Moshavi in view of Dimos does not expressly disclose that each SIC-ATRF processor further comprises a frequency shift processor connected between the respread processor and the adaptive temporal filter. Komatsu teaches, in a CDMA communication system (col. 1, lines 7-12), using a frequency shift processor, placed after a detection circuit, in order to correct for Doppler shift (Fig. 3; col. 1, lines 14-21; and col. 5, lines 29-67). Examiner notes that by placing the frequency shift processor after the respreader, the frequency processor will remove the Doppler frequency shift from the output reconstructed signal. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to connect a frequency shift processor between the respread processor and the adaptive temporal filter in order to correct for Doppler shift in the reconstructed signal.

26. Regarding claim 11, Moshavi in view of Dimos in further view of Komatsu discloses that each frequency shift processor comprises means to shift the frequency of the signal output from the respread processor to take into account Doppler spread (Komatsu: Fig. 3; col. 1, lines 14-21; and col. 5, lines 29-67).

27. Regarding claim 19, incorporating the rejection of claim 12, Moshavi in view of Dimos disclose each limitation of claim 19, as outlined in claim 12, except shifting, in a frequency shift processor, the symbol estimate generated by the respread processor for the user associated with the SIC-ATRF processor. Komatsu teaches, in a CDMA communication system (col. 1, lines 7-12), using a frequency shift processor, placed after a detection circuit, in order to correct for Doppler shift (Fig. 3; col. 1, lines 14-21; and col. 5, lines 29-67). Examiner notes that by placing the frequency shift processor after the respreader, the frequency processor will remove the Doppler frequency shift from the output reconstructed signal. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to shift, in a frequency shift processor, the symbol estimate generated by the respread processor for the user associated with the SIC-ATRF processor in order to correct for Doppler shift in the reconstructed signal.

28. Regarding claim 20, Moshavi in view of Dimos in further view of Komatsu disclose that the channel estimation step further comprises: determining the adaptive filter tap weights that minimize a pre-determined cost function between the received signal and an output of the adaptive filter and updating, in the ATRF, the filter tap weights (Moshavi: pages 130-131, Successive Interference Cancellers and Dimos: col. 2, lines 31-45) where Dimos teaches using a minimum cost weight update processor (Dimos: col. 2, lines 31-45) where the weights are determined for samples received over a channel (Dimos: col. 2, lines 31-45).

29. Regarding claim 21, Moshavi in view of Dimos in further view of Komatsu disclose that the channel estimation step further comprises: determining the adaptive filter tap weights by jointly minimizing the cost function between the received frequency shift estimate and the sum of the outputs of the frequency shift processors of previous SIC-ATRF processors and updating, in the ATRF, the filter tap weights (Moshavi: pages 130-131, Successive Interference Cancellers and Dimos: col. 2, lines 31-45) where Dimos teaches using a minimum cost weight update processor (Dimos: col. 2, lines 31-45) where the weights are determined for samples received over a channel (Dimos: col. 2, lines 31-45).

30. Claims 54, 55, and 57-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moshavi, Shimon (Moshavi, Shimon, "Multi-User Detection for DC-CDMA Communications," IEEE Communications Magazine, October 1996, pp. 124-133.) in view of Dimos et al. (USPN 5,596,600) in further view of Upadhyay et al. (USPN 6,115,409).

31. Regarding claim 54, incorporating the rejection of claims 1 and 12, Moshavi in view of Dimos disclose each limitation of claim 54, as outlined in claims 1 and 12, except that the input signal is a vector comprised of one signal from each antenna in an antenna array of the receiver where the signal is processed using a plurality of STAP/VSIC-ATRF processors combining space-time adaptive processing. Upadhyay teaches, in an interference canceling system, that it is well known to use STAP where an input signal is a vector comprised of one signal from each antenna in an antenna array of the receiver (col. 3, lines 1-15 and col. 4, lines 9-31) in order to cancel narrowband interference (col. 3, lines 1-3). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to have the input signal be a vector comprised of one signal from each antenna in an antenna array of the receiver where the signal is processed

using a plurality of STAP/VSIC-ATRF processors combining space-time adaptive processing in order to cancel narrowband interference.

32. Regarding claim 55, Moshavi in view of Dimos in further view of Upadhyay suggests that each STAP processor comprises: a plurality of filters, one per antenna; a mathematical summation processor for combining the outputs of all the filters; a conventional detector; and a minimum cost channel weight update processor (Moshavi: pages 130-131, Successive Interference Cancellers; Dimos: col. 2, lines 31-45; and Upadhyay: col. 3, lines 1-15 and col. 4, lines 9-31) where Dimos teaches using a minimum cost weight update processor (Dimos: col. 2, lines 31-45) where the weights are determined for samples received over a channel (Dimos: col. 2, lines 31-45).

33. Regarding claim 57, Moshavi in view of Dimos in further view of Upadhyay suggests that each STAP/VSIC-ATRF processor further comprises a plurality of respread processors (Moshavi: pages 130-131, Successive Interference Cancellers).

34. Regarding claim 58, Moshavi in view of Dimos in further view of Upadhyay suggests that each STAP processor further comprises a respread processor (Moshavi: pages 130-131, Successive Interference Cancellers).

35. Regarding claim 59, Moshavi in view of Dimos in further view of Upadhyay discloses that each ATRF comprises: tap weights (Dimos: col. 2, lines 19-45); a tap delay line (Dimos: col. 1, lines 48-64 and col. 2, lines 19-45) where the tap delay line is used to match the tap weights with the delayed samples (col. 1, lines 51-56); and a mathematical summing circuit (Dimos: col. 1, lines 51-56 and col. 2, lines 24-26) where "combining a minimum number of input samples to estimate interference" teaches a summing circuit.

36. Regarding claim 60, Moshavi in view of Dimos in further view of Upadhyay discloses that each ATRF further comprises a minimum cost channel estimate weight update processor (Moshavi: pages 130-131, Successive Interference Cancellers and Dimos: col. 2, lines 31-45) since Dimos teaches using a minimum cost weight update processor (Dimos: col. 2, lines 31-45) where the weights are determined for samples received over a channel (Dimos: col. 2, lines 31-45).

37. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moshavi, Shimon (Moshavi, Shimon, "Multi-User Detection for DC-CDMA Communications," IEEE Communications Magazine, October 1996, pp. 124-133.) in view of Dimos et al. (USPN 5,596,600) in further view of Upadhyay et al. (USPN 6,115,409) as applied to claim 55 above, and further in view of Park, Sheeyun (Park, Sheeyun, "A Blink Least-Squares Approach to STAP using MCARM Data," IEEE Signals, Systems & Computers, November 1998, pp.1552-1556.).

38. Regarding claim 56, Moshavi in view of Dimos in further view of Upadhyay does not expressly disclose that the STAP processor is a blind adaptive STAP processor. Park teaches, in a STAP system, using a blind adaptive STAP processor (title and abstract) in order to "adaptively place nulls at sources of interference without a need for training data" (pg. 1556: Conclusion). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a blind adaptive STAP processor in order to adaptively place nulls at sources of interference without a need for training data.

Conclusion

39. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sawahashi et al. (USPN 6,137,788) see Figs. 4, 5A, and 5B which are pertinent to a receiver that orders the input signals and then cancels interference using a plurality of successive interference cancellers.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (571)272-3152. The examiner can normally be reached on Mon.-Fri. 7:00-4:30 with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571)272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel J. Ryman
DJR Examiner
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